General

Guideline Title

Use of a DNA method, QF-PCR, in the prenatal diagnosis of fetal aneuploidies.

Bibliographic Source(s)

Langlois S, Duncan A. Use of a DNA method, QF-PCR, in the prenatal diagnosis of fetal aneuploidies. J Obstet Gynaecol Can. 2011 Sep;33(9):955-60. [23 references] PubMed

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

The quality of evidence (I-III) and classification of recommendations (A-L) are defined at the end of the "Major Recommendations."

1. Quantitative fluorescent polymerase chain reaction (QF-PCR) is a reliable method to detect trisomies and should replace conventional cytogenetic analysis whenever prenatal testing is performed solely because of an increased risk of aneuploidy in chromosomes 13, 18, 21, X or Y. As with all tests, pretest counselling should include a discussion of the benefits and limitations of the test. In the initial period of use, education for health care providers will be required. (II-2A)
2. Both conventional cytogenetics and QF-PCR should be performed in all cases of prenatal diagnosis referred for a fetal ultrasound abnormality (including an increased nuchal translucency measurement >3.5 mm) or a familial chromosomal rearrangement. (II-2A)
3. Cytogenetic follow-up of QF-PCR findings of trisomy 13 and 21 is recommended to rule out inherited Robertsonian translocations. However, the decision to set up a back-up culture for all cases that would allow for traditional cytogenetic testing if indicated by additional clinical or laboratory information should be made by each centre offering the testing according to the local clinical and laboratory experience and resources. (III-A)
4. Other technologies for the rapid detection of aneuploidy may replace QF-PCR if they offer a similar or improved performance for the detection of trisomy 13, 18, 21, and sex chromosome aneuploidy. (III-A)

Definitions:

Quality of Evidence Assessment*

I: Evidence obtained from at least one properly randomized controlled trial.

II-1: Evidence from well-designed controlled trials without randomization.

II-2: Evidence from well–designed cohort (prospective or retrospective) or case–control studies, preferably from more than one centre or research group.

II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category.

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

*Adapted from the Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.

Classification of Recommendations†

A. There is good evidence to recommend the clinical preventive action.

B. There is fair evidence to recommend the clinical preventive action.

C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making.

D. There is fair evidence to recommend against the clinical preventive action.

E. There is good evidence to recommend against the clinical preventive action.

L. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making.

†Adapted from the Classification of Recommendations criteria described in the Canadian Task Force on Preventive Health Care.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Fetal chromosomal abnormalities (trisomy 13, 18, 21, triploidy, and sex chromosomal aneuploidies)

Guideline Category

Diagnosis

Evaluation

Clinical Specialty

Family Practice

Medical Genetics

Obstetrics and Gynecology

Preventive Medicine

Intended Users

Physicians

Guideline Objective(s)

To provide Canadian health care providers with current information on the use of quantitative fluorescent polymerase chain reaction (QF-PCR) or equivalent technology in the prenatal diagnosis of fetal chromosomal abnormalities

Target Population

Women at increased risk of having a pregnancy affected by a common aneuploidy because of maternal age, abnormal prenatal screening results, or fetal soft ultrasound markers suggestive of an increased risk of aneuploidy

Interventions and Practices Considered

1. Quantitative fluorescent polymerase chain reaction (QF-PCR) to detect fetal aneuploidies
2. Conventional cytogenetics
3. Other technologies for detecting fetal aneuploidies (e.g., fluorescence in situ hybridization [FISH])

Major Outcomes Considered

- Sensitivity and specificity of diagnostic tests for detecting fetal aneuploidy
- Number of false-negative and false-positive diagnoses
- Residual risk of a chromosomal abnormality given normal quantitative fluorescent polymerase chain reaction (QF-PCR) results

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Searches of Unpublished Data

Description of Methods Used to Collect/Select the Evidence

Medline and PubMed were searched for articles published in English between January 2000 and December 2010 that presented data on the use of quantitative fluorescent polymerase chain reaction (QF-PCR) versus standard cytogenetic analysis of prenatal samples. A second search was done to identify publications in English that provided results of cytogenetic analysis performed on prenatal samples for women at an increased risk of fetal aneuploidy because of maternal age, abnormal prenatal screening results, or fetal soft ultrasound markers suggestive of an increased risk of aneuploidy. Publications were included if they provided detailed information on the abnormalities detected, regardless of whether or not rapid aneuploidy screening was undertaken.

Results were restricted to systematic reviews, randomized controlled trials, and relevant observational studies. Grey (unpublished) literature was identified through searching the websites of health technology assessment and health technology assessment-related agencies, clinical practice guideline collections, clinical trial registries, and national and international medical specialty societies.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Quality of Evidence Assessment*

I: Evidence obtained from at least one properly randomized controlled trial.

II-1: Evidence from well-designed controlled trials without randomization.

II-2: Evidence from well–designed cohort (prospective or retrospective) or case–control studies, preferably from more than one centre or research group.

II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category.

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

*Adapted from the Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The quality of evidence was rated using the criteria described in the Report of the Canadian Task Force on Preventive Health Care (see the "Rating Scheme for the Strength of the Evidence" field).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Classification of Recommendations†

A. There is good evidence to recommend the clinical preventive action.

B. There is fair evidence to recommend the clinical preventive action.

C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making.

D. There is fair evidence to recommend against the clinical preventive action.

E. There is good evidence to recommend against the clinical preventive action.

L. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision-making.

†Adapted from the classification of recommendations criteria described in the Canadian Task Force on Preventive Health Care.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

This Clinical Practice Guideline has been prepared by the Genetics Committee of the Society of Obstetricians and Gynaecologists of Canada (SOGC) and the Prenatal Diagnosis Committee of the Canadian College of Medical Geneticists (CCMG) and approved by the Executive and Council of the SOGC and the Board of Directors of the CCMG.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

This guideline promotes the use of a rapid aneuploidy DNA test for women at increased risk of having a pregnancy affected by a common aneuploidy. This will have the benefit of providing rapid and accurate results to women at increased risk of fetal Down syndrome, trisomy 13, trisomy 18, sex chromosome aneuploidy or triploidy. It will also promote better use of laboratory resources and reduce the cost of prenatal diagnosis.

Potential Harms

A small percentage of pregnancies with a potentially clinically significant chromosomal abnormality will remain undetected by quantitative fluorescent polymerase chain reaction (QF-PCR) but detectable by conventional cytogenetics.

Qualifying Statements

Qualifying Statements

This document reflects emerging clinical and scientific advances on the date issued, and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Local institutions can dictate amendments to these opinions. They should be well documented if modified at the local level. None of these contents may be reproduced in any form without prior written permission of the Society of Obstetricians and Gynaecologists of Canada (SOGC).

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Foreign Language Translations

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2011 Sep

Guideline Developer(s)

Canadian College of Medical Geneticists - Professional Association

Society of Obstetricians and Gynaecologists of Canada - Medical Specialty Society

Source(s) of Funding

Society of Obstetricians and Gynaecologists of Canada

Guideline Committee

Genetics Committee of the Society of Obstetricians and Gynaecologists of Canada (SOGC) and the Prenatal Diagnosis Committee of the Canadian College of Medical Geneticists (CCMG)

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

Disclosure statements have been received from all members of the committees.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the Society of Obstetricians and Gynaecologists of Canada Web site . Also available in French from the SOGC Web site .

Print copies: Available from the Society of Obstetricians and Gynaecologists of Canada, La société des obstétriciens et gynécologues du Canada (SOGC) 780 promenade Echo Drive Ottawa, ON K1S 5R7 (Canada); Phone: 1-800-561-2416.

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on January 18, 2012. The information was verified by the guideline developer on February 14, 2012.

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